IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Re: Application of: **Ridge et al.**
Attorney Docket: **944-001.131**
Serial No.: **10/797,635**
Group Art Unit: **2621**
Filed: **March 9, 2004**
Examiner: **Christopher G. Findley**

For: **METHOD AND DEVICE FOR MOTION ESTIMATION IN SCALABLE VIDEO EDITING**

Mailstop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Sir:

This Request for Review is in response to the final office action, mailed April 2, 2008.

******If any fee and/or extension is required in addition to any enclosed herewith, please charge Account No. 23-0442.***

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Date: July 30, 2009

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REMARKS

In the patent application, claims 3-17, 20-23, 25 and 27-33 are pending.
In the office action, all pending claims are rejected.

At section 4, claims 3-7, 9-17, 20-23, 25 and 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Koto et al.* (U.S. Patent Application Publication No. 2003/0215014 A1, hereafter referred to as *Koto*), in view of *Kim et al.* (U.S. Patent Application Publication No. 2003/0123539 A1, hereafter referred to as *Kim*).

In rejecting claim 4, the Examiner states that *Koto* discloses a method for video encoding wherein M reference frames are selected for a given original frame and each frame is partitioned into a plurality of blocks so as to obtain the block difference based on a summation of differences between a block in the original frame and the blocks in the reference frames. The Examiner further states that *Koto* discloses optimizing the offset at least partially based on the block difference (paragraph [1046]).

The Examiner admits that *Koto* fails to disclose using the absolute values of the differences in the summation, but points to *Kim* for disclosing computing motion vectors using the sum of absolute difference (*SAD*) based block matching scheme (paragraph [0017]), and the *SAD* calculation compares current reconstructed previous luminance samples on a pixel-by-pixel basis (Equation 2; paragraphs [0018]-[0022]). The Examiner further states that it would be obvious for a person skilled in the art to combine the *SAD* calculation of *Kim* with the coding scheme of *Koto* in order to provide a system capable of adaptive quantization having all the features of claim 4.

It is respectfully submitted that the claimed invention is concerned with optimizing the offset between a reference block and a rectangular block based on the block difference obtained from a summation of absolute values of differences between a block in the original frame and the blocks in the reference frames. Adaptive quantization has nothing to do with the claimed invention.

One of the differences between the claimed invention and *Koto* is that the claimed invention optimizes the offset based on the block difference obtained from a summation of absolute values of differences between coefficients in the reference block and coefficients in the rectangular block, whereas *Koto* derives the error signal for the

macroblocks in an incoming video frame based on the minimum difference between the linear sums 130-133 and the incoming video image 100 (paragraph [0146]).

In the Advisory Action, mailed July 13, 2009, the Examiner states that the selector in the combined system would compare the signal 131 (should be video macroblock signal extracted from the input video signal 100, see paragraph [0059]) with other signals 130, 132 and 133 (should be 130-133) in order to select the predictive macroblock signals which exhibits a minimum error for each macroblock. Thus, in the combined system as suggested by the Examiner, the only change is the adaptation of the quantization parameters, while the selection of the prediction picture signal 106 remains the same. By doing so, the combined system still derives the error signal for the incoming video frame based on the difference between video image 100 and one of linear sums 130-133. The suggested combined system does **not** optimize the offset based on the summation of absolute values of differences as claimed. Such a combination does not render claim 4 obvious.

Alternatively, the SAD computation method, according to *Kim*, is carried out before the prediction picture signal 106 is selected in the encoders as disclosed in *Koto*. This means that a minimum sum of the absolute differences between the coefficients in a macroblock in the incoming video signal 100 and the coefficients in each of the block signals 130-133 must be computed.

In the Request for Reconsideration, mailed June 16, 2009, applicant pointed out that, in the method as disclosed in *Kim*, only **one** reconstructed previous frame R is used to compare with the to-be-encoded macroblock *C[i, j]* in order to compute the minimum block difference SAD. If the SAD computation, according to *Kim*, is incorporated into the encoders according to *Koto* before the prediction picture signal 106 is carried out, all the block signals involving weighting factors must be discarded.

Furthermore, a SAD value, even a minimum one among a plurality of SAD values computed over a search area S, is always positive or zero, whereas a predicted error can be positive or negative. Thus, the computed SAD value cannot be used as the prediction error signal 101. The prediction picture signal 106 must be computed either from the block signal 130 or from the block signal 131 as in the original encoders, according to *Koto*.

Also, the encoding method, according to *Kim*, includes the encoding the prediction error signal, a first index indicating a plurality of reference frames, a second index indicating the weighting factors and the motion vector. If weighting factors are no longer used, the encoding method is also changed.

It is respectfully submitted that *Koto* intends to use various linear combinations of reference blocks from a plurality of previous frames in order to reduce the computational overhead so that video operations involving enlargement/reduction, rotation and fade-in/fade-out of pictures can be reduced (paragraphs [0008], [0233]). *Koto* introduces many different ways to calculate the weight factors (see Equations 2, 5-12, 17) in order to realize high-efficiency, high-picture-quality video encoding and decoding with higher prediction efficiency (paragraph [0233]). By eliminating the weighting factors all together, one changes the intended purpose of *Koto*.

If one skilled in the art modifies the encoders as disclosed in *Koto* so that the block difference is computed based on **only one** past frame as disclosed in *Kim*, the predictive macroblock generators 119, 219 in Figures 1-3 must be changed, and the predictive macroblock generators 151, 251 in Figures 8, 9 and 19 become useless. This would drastically change the principle of operation of the encoder as disclosed by *Koto*.

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. MPEP 2143.01 VI. If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or modification to make the proposed modification. MPEP 2143.01 V.

For the above reasons, *Koto*, in view of *Kim*, fails to render independent claim 4 obvious.

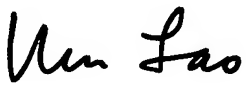
For the same reasons, *Koto*, in view of *Kim*, also fails to render independent claim 21 obvious.

As for claims 3, 5-17, 20, 22, 23, 25, 27-33, they are dependent from claims 4 and 21. For reasons regarding claims 4 and 21 above, claims 3, 5-17, 20, 22, 23, 25, 27-33 are also allowable.

CONCLUSION

Claims 3-17, 20-23, 25 and 27-33 are allowable. Early allowance of all pending claims is earnestly solicited.

Respectfully submitted,



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